

From the Editors

Worldwide, over 100 000 people have received cochlear implants. As the signal processing capabilities of cochlear implants become more sophisticated and our understanding of audition and cochlear implants grows, researchers and cochlear implant designers continue to explore methods of improving cochlear implant design, fitting procedures, and aural rehabilitation methods. This issue focuses on advances in cochlear implant telemetry, clinical issues regarding binaural hearing and cochlear implant fitting, the role of auditory training in optimizing benefit from a cochlear implant, and research to understand how processing might be improved to allow better recognition of talker emotion by cochlear implant users.

The first article by Lucas Mens provides a tutorial on new developments in the hardware and software of telemetry systems for cochlear implants. He reviews the uses of telemetry for monitoring the function of the implant and for assessing neural responsiveness. He also considers future applications of telemetry for determining optimal settings and signal processing parameters of the implant.

In the second article, Theresa Ching, Emma van Wanrooy, and Harvey Dillon enumerate potential benefits of supplying a binaural signal to persons with bilateral severe to profound sensorineural hearing loss and provide a critical review of the literature regarding actual binaural benefits of a bimodal fitting (cochlear implant with hearing aid on opposite ear) or a bilateral fitting (two cochlear implants). Clinical issues regarding candidacy for bimodal or bilateral fitting are outlined, and the need for research in this important area is discussed.

The third article by Qian-Jie Fu and John J. Galvin III describes a computer-assisted training program for improving speech and music perception by cochlear implant users. The authors present information about perceptual learning with and without training and the benefit that can be obtained from systematic training approaches. They

consider the variables that might influence the effectiveness of an auditory training program and provide data from their own work.

The final article by Xin Luo, Qian-Jie Fu, and John J. Galvin III examines the ability of cochlear implant users to recognize a talker's emotional state. They describe the development of the House Ear Institute Emotional Speech Database and the acoustic features of the test stimuli, normative data obtained from cochlear implant users and persons with normal hearing, and several experiments examining the roles of amplitude, spectral, and temporal cues by cochlear implant users and normal hearing users listening to acoustic cochlear implant simulations. Implications for improvements in cochlear implant processing are discussed.

About the Authors

Lucas H. M. Mens is an audiologist from the Department of KNO/Audiologie of the Radboud University Nijmegen Medical Centre, the Netherlands. He joined the Nijmegen-St Michielsgestel cochlear implant team in 1988 and has contributed to several projects on cochlear implant safety and efficacy. He has published several articles on objective measures of implant integrity and extracochlear current spread, and more recently, he has developed intracochlear measures of current spread through telemetry, which contributed to a commercial implementation.

Teresa Ching earned her PhD from the University of London and is presently a senior research scientist at the National Acoustics Laboratories (NAL) in Australia. She has authored or coauthored over 40 articles on the audibility and speech recognition of people with hearing loss, methods for evaluating amplification for children, prescribing amplification for adults and children, binaural amplification for people with cochlear implants and hearing aids, and outcomes of early intervention and device fitting. She has presented her research findings at many international conferences.

Emma van Wanrooy earned her master's in audiology from Macquarie University and worked as a clinical audiologist for Australian Hearing from 1998 to 2003 before joining NAL. For the last 4 years, she has worked as a research audiologist at NAL and has been involved in studies focused on bimodal fitting and amplification for children.

Harvey Dillon earned his PhD from the University of New South Wales and joined NAL where he has held various positions. He is currently director of research at NAL and deputy director of the Co-operative Research Centre for Cochlear Implant and Hearing Aid Innovation. Dr Dillon is well known for his research and publications in the areas of speech discrimination testing, audiological testing in sound fields, speech processing for hearing aids, hearing aid fitting methods, and the acoustics of hearing aid coupling systems. He is the author or coauthor of over 110 scientific articles, 10 book chapters, and a comprehensive text book on hearing aids. The hearing aid prescription procedures and other evaluation procedures developed by Dr Dillon and colleagues are used worldwide.

Qian-Jie Fu received his BS degree from the University of Science and Technology of China in 1991, MS degree from the University of Science and Technology of China in 1994, and PhD degree from the University of Southern California in 1997. He joined the Department of Auditory Implants and Perception at the House Ear Institute in 1996. He is currently a scientist and chief of the Section on Speech Technology and Hearing Research. He is also

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John J. Galvin III is presently a senior research associate in the Department of Auditory Implants and Perception at the House Ear Institute. He received a BA from Hampshire College in 1990. He is currently researching cochlear implant users' music perception, as well as novel speech processing algorithms to enhance implant users' performance in noise and other difficult listening conditions.

Xin Luo received both BS and PhD degrees in electrical engineering from the University of Science and Technology of China, Hefei, China, in 1999 and 2004, respectively. He joined the Department of Auditory Implants and Perception at the House Ear Institute in 2002. He is currently a postdoctoral researcher in the Section on Speech Technology and Hearing Research. His research interests include speech processing, hearing research, auditory psychophysics, and cochlear implants.

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